

Serial No.: 10/533,650

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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re **PATENT** application of:

Applicant: Haruo WAKAYAMA

Serial No.: 10/533,650

Art Unit: 3724

Filed: May 5, 2005

Title: **SCRIBE LINE FORMING DEVICE AND SCRIBE LINE FORMING METHOD**

Examiner: Sean M. Michalski

Docket No.: YAMAP0979US

**AMENDED APPEAL BRIEF**

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Sir:

This Amended Appeal Brief is being submitted in connection with the appeal of the above-identified application. If there are any additional fees resulting from this communication, please charge the same to our Deposit Account No. 18-0988, our Docket No. YAMAP0979US.

**REMARKS**

The Examiner issued a Notice of Non-Compliant Appeal Brief. At the outset, the Examiner indicates that the subject Appeal Brief was filed on January 2, 2009, which appears to be an error. Applicant submits that the subject Appeal Brief was filed on December 5, 2008.

The Examiner has indicated that the original Appeal Brief is non-compliant with respect to Section V, the Summary of the Claimed Subject Matter. In particular, the Examiner indicates that, as to each "mean-plus-function" element under 35 U.S.C. § 112, paragraph 6, Appellant has not pointed out the structures in the specification that perform each function with sufficient specificity. The means-plus-function elements include (1) the impact force applying means, (2) the heating means, (3) the cooling means, and (4) the arrangement movement means. (See apparatus claims 1 and 5.)

In accordance with the Examiner's comments, an amended Section V of the Appeal Brief is provided below.

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## V. Summary of the Claimed Subject Matter

Independent claim 1 recites scribe line forming apparatus (page 7, lines 21-24; Figs. 1 and 2) comprising a vertical crack forming member that has a blade at a tip thereof and is used for forming a vertical crack to be an origination point of a scribe line by pressing the blade against a surface of a brittle substrate with pressure (page 9, lines 1-19); an impact force applying means for applying an abrupt impact force (see, e.g., structures described at page 9, line 20 to page 10, line 22; page 19, line 26 to page 20, line 9; and depicted in Figs. 1 and 7, including armature 6 having a spring and solenoid coil 6a) to the vertical crack forming member in order to generate the vertical crack having a predetermined depth at a desired position in the brittle substrate (page 9, line 20 to page 10, line 22; page 19, line 26 to page 20, line 9); a heating means (see, e.g., structures described at page 11, lines 10-20; and depicted in Figs. 1 through 7 including a laser beam oscillator 8, and/or a heating source that uses infrared rays or ultraviolet rays besides laser beams to heat the substrate) for forming an area having a temperature lower than a softening point of the brittle substrate (page 17, lines 4-11); a cooling means for cooling the brittle substrate (see, e.g., structures described at page 10, line 23 to page 11, line 9; and depicted in Figs. 1, 3a-e, 4, 6a-e, and 7, including cooling nozzle 7); an arrangement movement means for arranging (see, e.g., the structures described at page 11, lines 21-23; page 22, lines 8-11; and depicted in Figs. 2 and 5 including guide rail 103 on frame 102), the heating means, the vertical crack forming member, the impact force applying means, and the cooling means to be positioned so as to move relative to the brittle substrate at predetermined intervals along a planned scribe line that is prearranged on the surface of the brittle substrate (page 11, line 21 to page 12, line 1; page 22, lines 8-11); and a control unit (page 12, lines 2-14) that controls driving of the impact force applying means (page 15, lines 3-19). (See generally page 3, line 24 to page 4, line 13.)

Dependent claim 5 recites the scribe line forming apparatus according to claim 1, wherein the arrangement movement means (see claim 1) either arranges the vertical crack forming member, and the heating means (see claim 1), and the cooling means (see claim 1) to be positioned in the stated order from a fore side of the planned scribe

line (page 5, lines 7-10; page 13, line 26 to page 14, line 9), or arrange the heating means, the vertical crack forming member, and the cooling means to be positioned in the stated order from the fore side of the planned scribe line (page 5, lines 10-13; page 13, line 26 to page 14, line 9).

Independent claim 14 recites a scribe line forming method comprising the steps of: while making a vertical crack forming member having a blade at a tip thereof move on a brittle substrate, generating a vertical crack having a predetermined depth at a desired position on a brittle substrate with an impact force applying means that applies an abrupt impact force to the blade (page 9, line 20 to page 10, line 22; page 19, line 26 to page 20, line 9); and forming a scribe line by forming, with the vertical crack, an irradiation area that has a temperature lower than a softening point of the brittle substrate along a planned scribe line arranged on the brittle substrate (page 17, lines 4-11), and forming a cooling area in rear of the irradiation area (page 17, lines 12-20). (See generally page 6, lines 9-19.)

Dependent claim 15 recites the scribe line forming method according to claim 14, wherein the generating step of generating the vertical crack having the predetermined depth at the desired position on the brittle substrate by the impact force applying means is performed when the blade is positioned in the vicinity of an edge of the brittle substrate (page 6, lines 20-24; page 15, lines 3-6 and 20-22) and in the vicinity of an intersection position at which the blade intersects a previously-formed scribe line (page 6, lines 24-26; page 18, line 3 to page 19, line 20).

Dependent claim 16 recites the scribe line forming method according to claim 14, wherein the vertical crack is formed at a position slightly inside from an edge of the substrate (page 26, lines 20-26).

Respectfully submitted,

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